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| EXAMINER | |
|---|---|
| WARREN, DAVID S | |
| ART UNIT | PAPER NUMBER |
| 2837 | |

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|---|---|---|
| 3 MONTHS | 02/08/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/759,442 | HOSLER, DAVID | |
| | Examiner | Art Unit | |
| | David S. Warren | 2837 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *07 November 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-27 and 30-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20,22-27 and 30-33* is/are rejected.

7)☒ Claim(s) *21* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *3/23/05* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 - 3, 7, and 18, are rejected under 35 U.S.C. 102(b) as being anticipated by Montagu (5,225,770). Regarding claim 1, Montagu discloses the use of a transducer comprising a housing (28) enclosing a cylindrical permanent magnet (27; figs. 2 – 4), magnet having a first and second end face (figs. 2 – 4) and a curvilinear side surface (figs. 4 and 6), a coil (75) coupled to the housing, wherein the magnet has a side-to-side polarization (figs. 4, 6, and 14 – 16), and wherein the magnet and housing are configured such that the magnet moves relative to the coil (col. 6, lines 66 – 69). (Note: the preamble of claim 1 is deemed to be an intended use and is not afforded any patentable weight, however, the device of Montagu is deemed to be able to convert between mechanical vibration and electrical signals.) Regarding claim 2, Montagu shows that an axis passes through the first and second end faces (79, fig. 6), and semi-cylindrical north and south poles (col. 6, lines 64 – 66). Regarding claim 3, element 44 is deemed to be synonymous with a diaphragm (i.e., a "disk" as defined by The American Heritage Dictionary, 2nd ed. 1982). Regarding claim 7, Montagu discloses the

use of a bobbin (50) to constrain the coil to the housing. Regarding claim 18, the galvanometer of Montagu is a sensor that converts electrical signals to mechanical "signals" (this meets Applicant's limitation of "converting between mechanical vibration and electrical signals" since the phrase "converting between" does not specify electrical-to-mechanical or mechanical-to-electrical conversion). All other limitations of claim 18 have been discussed supra.

3. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Merrill (2,525,456). Merrill discloses a transducer (i.e., converts energy of one form to that of another form) having a housing (14), a substantially cylindrical permanent magnet (4) having a first and second face (fig. 3), a coil couple to the housing (col. 3, first paragraph), wherein the magnet has a side-to-side polarization (fig. 2) such that the magnet moves relative to the coil.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 4 – 6, 8, 10, 11 – 17, 19, 20, 22, 25 – 27, 30, and 31 – 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Montagu (discussed supra) in view of Idogaki (4,922,753). Montagu has been shown in the previous paragraph to teach

limitations of independent claims 1 and 18. Regarding claims 4 and 5, Montagu does not teach the use of a diaphragm that permits linear and rotational movement. The diaphragm or pressure washer (believed to be a spring or wave washer by the Examiner) would accommodate both linear and rotational vibration. The Examiner acknowledges that the wave washer is intended to *limit* movement in the linear direction, however, the pressure washer *will not eliminate all* (and therefore, will still "permit" some) linear movement. Regarding claim 6, any movement of magnet (27, 100) will induce a current in the coil. Regarding claims 8 and 25, as discussed supra, Montagu discloses a transducer for converting between mechanical vibration and an electrical signal, having a housing, coil, a cylindrical permanent magnet having a first and second face and a curvilinear side surface, wherein the magnet is configured to have a side-to-side polar orientation (as discussed above, all these features can be seen in figs. 4, 6, and 14 – 16). Montagu does not teach the use of suspending the magnet in ferrofluid within the housing. Idogaki discloses suspending a magnet (2) in a ferrofluid (1). It would have been obvious to one of ordinary skill in the art to combine the teachings of Montagu and Idogaki to obtain a transducer having a magnet with a curvilinear side surface and a side-to-side polar orientation suspended in a ferrofluid. The motivation for making such a combination is taught by Idogaki (col. 5, lines 3 – 38) wherein the magnetic fluid allows a repulsion force to exist between the magnet and the case wall (specifically, see lines 28 – 34) to stabilize the position of the permanent magnet (col. 5, lines 7 – 10). Assuming *arguendo* regarding non-analogous art, the Examiner's position is that both Montagu and Idogaki show "converting between"

mechanical and electrical signals. The art here being considered is elementary electromagnetic theory wherein a moving magnetic field induces current is a wire, and therefore, Montagu and Idogaki are analogous. The limitations of claim 10 have been discussed supra (see Idogaki, figs. 4, 6, and 14 – 16). Regarding claims 11 and 26, Idogaki teaches that the ferrofluid acts as a liquid spring (col. 8, lines 27 – 30). Regarding claims 12 and 27, Idogaki shows that the fluid damps external vibration (the Examiner maintains that any viscoelastic fluid will inherently dampen vibration – see col. 8, lines 27 – 30; especially those having a spring force). Regarding claims 13 and 30, the ferrofluid of Idogaki is a synthetic oil (col. 10, lines 16 – 22). Regarding claims 14 and 15 Montagu teaches the use of an insert to prevent the magnet from freely spinning (col. 6, second paragraph). Regarding the limitations of claim 16, the Examiner maintains that whenever a magnet is moved relative to a coil, current will be induced in the coil, therefore, claim 16 is deemed to be inherent in both the teachings of Montagu and Idogaki. Regarding claim 17, Montagu teaches the use of bobbin (col. 5, lines 14 – 19). Regarding claims 19 and 20, one of ordinary skill in the art would seek to orient transducers in the most optimal direction and any location is deemed to be a distinct location. Regarding claim 22, Idogaki discloses the use of sensors wired to an amplifier (fig. 17). Regarding claim 31, any viscoelastic fluid will act as a damping fluid. Regarding claims 32 and 33, all limitations have been discussed supra (see the discussion regarding claims 14 and 15).

6. Claims 19, 20, and 22 – 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Montagu ('770) in view of A. Company (2,680,986). Montagu

teaches all limitations of independent claim 18. Montagu does not explicitly teach the limitations of claims 19 and 20 (although, as stated supra, the Examiner believes these limitations to be within the purview of one of ordinary skill in the electromagnetic transducer art). Company discloses that plural transducers are oriented in substantially the same direction (fig. 1) and that the transducers are located on a distinct location on a soundboard. It would have been obvious to one of ordinary skill in the art to combine the teachings of Montagu and Company to obtain a cylindrical magnet with curvilinear side surfaces and a side-to-side polarization located in the same direction at a distinct location on a soundboard. The motivation for making this combination is that sound boards do not vibrate in a single direction and a rotatable magnet would transducer more than one direction of vibration at multiple points on the instrument. (See comments below regarding an assumed arguendo pertaining to non-analogous art.) Regarding claim 22, Company discloses the use of an amplifier (col. 2, lines 1 – 3). Regarding claim 23, Company discloses that sensors are hidden from view on an interior surface of a soundboard (fig. 2). Regarding claim 24, Company discloses the use of a guitar (figs. 1 and 2). It would have been obvious to one of ordinary skill in the art to provide the teachings of Montagu with those of Company. The motivation for making this combination is that electronics added to the surface of a guitar can detract from the aesthetic value as well as obstruct proper positioning of the musicians hands and fingers.

***Allowable Subject Matter***

7. This Application contains allowable subject matter. Regarding claim 1, the Examiner suggests removing "converting between mechanical vibration and electrical signals" from the preamble and add it as a limitation as "converting mechanical vibration to electrical signals" and then adding the limitations of either claim 4 or claim 5 to claim 1. In this way, as perceived by the Examiner, the Applicant's transducer would now "convert" rotational and linear vibrations to an electrical signal. As this claim is currently written, the transduction can go either from mechanical to electrical or electrical to mechanical – thus opening the Examiner to use references from either field (i.e., the Merrill reference). The Examiner requests that the claim emphasize vibration (not in the preamble) and the linear/rotational vibration.

8. Claim 8 would be allowable if "converting between mechanical vibration and electrical signal" were removed from the preamble and added as a limitation to the claim as "converting mechanical vibration to an electrical signal."

9. Claim 20 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

10. Applicant's arguments with respect to claims 1 – 27 and 30 – 33 (it is noted that there are no claims 28 and 29) have been considered but are moot in view of the new ground(s) of rejection. Assuming *arguendo*, the Examiner assumes the Applicant will object to the combination of non-analogous art and the motivation to combine. While these are valid arguments, the Examiner deems the references to be analogous since both rely on a magnet moving relative to a coil (basic electromagnetic theory). Furthermore, the Examiner is not suggesting that the invention of Idogaki be physically combined with Montagu, but rather what the teachings would suggest to one of ordinary skill in the art. And one of ordinary skill would consider using one system with the other since they both are merely supplying a relative movement between a magnet and a coil.

11. Finally, the Applicant is cautioned, when amending the claims, to be aware of the large body of art relating to moving magnet-type transducers, e.g., moving magnet speakers, microphones, motors, etc. (and many references use ferrofluids for various purposes). Also, many transducers, say for example motors, can also be used to generate electricity – in other words, they convert "both ways" between mechanical and electrical energy.

***Conclusion***

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Warren whose telephone number is 571-272-2076. The examiner can normally be reached on M-F, 9:30 A.M. to 6:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lincoln Donovan can be reached on 571-272-2837. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Dsw

David S. Warren
Patent Examiner

LINCOLN DONOVAN
SUPERVISORY PATENT EXAMINER